IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Peter Cole Goodwin *et al.*
Serial No.:	10/070,218
Filing Date:	July 19, 2002
Group Art Unit:	1755
Examiner:	Marcantoni, Paul D.
For:	***Extrudable Cementitious Material***

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.132

I, Chongjun Jiang, hereby declares as follows:

1. I am one of the inventors of United States Patent Application No.10/070,218 (hereinafter referred to as "the subject patent").
2. A copy of my qualifications and experience in this field is attached as **Exhibit A**.
3. A copy of the United States Patent and Trademark Office ("USPTO") Office Action having a mailing date of November 9, 2006 ("the Office Action") is attached as **Exhibit B**. I have read the Office Action, and in particular his rejections under 35 U.S.C. 102(b), which I understand are novelty rejections, and 35 U.S.C. 103, which I understand are obviousness rejections.
4. A copy of the claims pending in the subject patent, namely, claims 12, 14-20 and 22 is attached as **Exhibit C**. The following discussion relates to the claims shown in Exhibit C.
5. By way of background, there are many conventional methods for forming fibre-reinforced cementitious formulations, each having their own advantages and disadvantages. Such methods comprise the Hatschek sheet processes, Mazza pipe processes, Magnani sheet processes, injection moulding, hand lay-up, casting, filter

pressing, roll forming, etc. Each of these conventional methods requires the use of a slurried fibre-reinforced cementitious formulation. In contrast, the present invention relates specifically to an extrudable fibre-reinforced cementitious formulation. Extrusion of a fibre-reinforced cementitious formulation provides a number of advantages over these conventional processing methods, however most notably shapeability of the extrudate, since the extrudate is substantially self-supporting.

6. An extrudable fibre-reinforced cementitious formulation is a very different formulation to one which may be processed according to the conventional methods of processing discussed above, for a number of reasons. An extrudable cementitious formulation has a particular water content, the extrudate is self supporting, and the formulation is such that during extrusion (which is typically conducted under high pressure) the extrudable formulation does not dewater under extrusion pressure, rather, the formulation is conveyed through the extruder in an approximate plug-flow. Further, the extrudate is preferably substantially homogenous. These characteristics of an extrudable fibre-reinforced cementitious formulation are different to a slurried/pourable/pumpable cementitious formulations, since they have substantially higher water content, are not self-supporting nor are they extrudable.

7. The viscosity and rheology profile of an extrudable formulation is critical to its extrudability. The water content of the formulation significantly affects these parameters. One cannot simply take any cementitious formulation and extrude it. For example, a "mortar" may be self supporting but it would certainly not be extrudable, since it would dewater under the pressure of extrusion and may not even exit the die. Further, a slurry would not have the rheological profile to be successfully extrudable, i.e., even if it survived passing through the die it would not be a self-supporting extrudate. I consider that terms such as mortar, slurry, "flowing concrete", "fluid concrete", "pumpable composition" to be synonymous. None of these cementitious formulations are extrudable. Extrudability is completely different from flowability, pourability or pumpability. The terminology "extrudable cementitious formulation" refers only to those formulations having a water content sufficient to enable extrusion, and only those formulations which would successfully process on a suitable extruder.

8. Material to my assertion that extrusion processing of fibre-reinforced cementitious formulations is very different to other methods of processing such formulations is the fact that, to my knowledge, none of the major extruder manufacturers market extrusion apparatuses for fibre-reinforced cementitious formulations. This is primarily due to the difficulty and complexity in extruding such formulations/compositions. Indeed, when conducting our research which resulted in the present invention we had no option but to purchase a conventional extruder and significantly modify the process and cementitious formulation to suit our proposed apparatus, i.e., there was no knowledge of whether one could extrude fibre reinforced cement. Indeed, it does not follow that one who is an expert in fibre-reinforced cementitious materials could necessarily be able to make a formulation that is extrudable. This was certainly not a trivial exercise. It would be unreasonable to assert that the claimed invention was anticipated by the prior art, or even obvious in view of the prior art (which I shall discuss in more detail below).

9. Further, one cannot simply add or subtract water at will to render a formulation extrudable. Indeed, it is impractical to define a specific water content, or even a range of water contents for an extrudable cementitious formulation. This is because the water content, as the skilled person would be aware, depends upon the type of cement being used, the particular additives being used and their type (and sometimes even their source), the ratios of ingredients etc. Furthermore, the properties of the final extruded cementitious product, e.g. density , strength, toughness etc, are significantly influenced by the water content.

10. In regard to the subject patent, in order to provide an extrudable cementitious formulation we have found the use of a Dispersion Agent (DA) in the extrusion of a cementitious formulation will increase the efficacy of a Viscosity Enhancing Agent (VEA) during extrusion of a cementitious material containing that VEA. In particular, we discovered an unexpected synergy between the two agents, which synergy is manifested in the ability to either:

    i) allow a reduced dosage of VEA as compared with a conventional dosage whilst still maintaining extrudability of the cementitious material; or

    ii) allow the use a lower grade or lower molecular weight VEA than is conventional; or

iii) improve extrudability whilst using a substantially conventional dosage of VEA. Furthermore, this unexpected synergy allows the use of lower extrusion pressures than that when using VEA alone, and improves the surface smoothness and strength of the extrudate due to improved particle packing and reduced air-entrainment.

11. I have reviewed the documents raised in the Office Action and I note that the majority of the documents relate to slurries and mortars which, as discussed above, are completely different to the extrudable cementitious formulations of the subject patent. In view of the significant differences between slurried cementitious formulations and extrudable cementitious formulations as discussed above, I do not look to prior art which relates to slurried cementitious formulations since it is irrelevant for extrudable cementitious formulations, and in fact, such publications actually teach away from extrusion.

12. Accordingly, these prior art documents, which do not teach extrusion of cementitious formulations, are irrelevant to the claimed invention. Furthermore, even if any of these prior art documents refer to extrusion, they do so only in passing and further fail to teach the combination of the claimed compounds, in the claimed ranges. Such oblique reference to extrusion fails to form a sufficient basis to anticipate the claimed invention or render it obvious. My comments on the individual prior art documents are as follows:

13. Naji et al ('067) does not teach nor suggest extrudable cementitiuous formulations, and accordingly is irrelevant to the claimed invention.

14. McCurrich et al ('480) does not teach nor suggest extrudable cementitiuous formulations, and accordingly is irrelevant to the claimed invention. The document relates to "pumpable" concrete compositions (see the Examples). The Examiner also notes that the claimed invention is "a new intended use of a known composition" (page 12 of the Examiner's report). The Examiner is incorrect in this regard since the instant formulation was not known since it is an extrudable cementitious formulation, as opposed to slurried (and similar) formulations (as discussed above).

15. By the Examiner's own admission AU 55929/86 does not teach the claimed invention. Furthermore the document does not teach nor suggest extrudability and accordingly is irrelevant to the claimed invention.

16. Kawai et al ('364) relates to "highly flowing concretes" and does not teach nor suggest extrudability, and accordingly is irrelevant to the claimed invention. Similar comments apply to Matsuoka et al ('821), Burge et al ('123) and Valore ('231).

17. Wada et al ('771) does not teach the claimed dispersion agent, nor does it suggest the surprising synergy between the claimed DA and VEA.

18. In relation to Risch et al ('557), not only does the document not teach the claimed invention, it does not even suggest it. To explain, the polymers taught by Risch are clearly not viscosity enhancers, as one skilled in the art would be aware. In fact, they are specifically chosen to "...bring increased strength and durability..." (col. 10, lines 51-52). Further, Risch asserts at col. 8 lines 47-54 that the dispersion agent and polymer latices "...reduce the viscosity of the formulation...". Accordingly, Risch does not anticipate or even suggest the claimed invention.

19. Sobolev et al ('289) refers only in passing to extrusion (the only reference to extrusion is at the foot of column 5, at line 65). There is no clear enablement of extrusion and hence the document does not anticipate or even suggest the claimed invention.

20. WO 86/00291 does not suggest extrusion and the formulations taught therein are clearly not extrudable.

21. By the Examiner's own admission Fujito et al (JP 06-127992) does not teach the claimed invention. Further, neither Hayakawa et al ('086) nor Downing et al ('199) teach the claimed invention.

22. In relation to Bobrowski et al ('145), the Examiner asserts that the addition of dispersion agent would have been an obvious design choice for one of ordinary skill in the art. Whilst it may be true that it may be obvious to incorporate a dispersion agent into a cementitious formulation, the document does not suggest extrusion, and therefore is irrelevant. Further, the Examiner has misinterpreted the cited passage in the document, which clearly relates to flowable concretes ("that is essentially self-levelling" col. 2 line 23), which, one skilled in the art would be aware, are low

viscosity and teach away from extrudable cementitious formulations. Further, the document does not teach or suggest the claimed invention.

23. Fukuba et al ('697), Scherrman et al ('383) and Dingsoyr do not teach nor suggest extrusion, and accordingly are irrelevant to the claimed invention.

24. In reviewing the documents raised in the Examiner's report I further note that none of these documents teach or suggest the functional claim limitation that:

"the quantity of dispersion agent is sufficient to increase the efficacy of the viscosity enhancing agent during extrusion of said extrudable cementitious formulation."

Accordingly, none of the prior art documents render the present invention obvious or lacking in novelty.

25. I note that the above-mentioned claim limitation is entirely consistent with language in the specification which states that:

> "...it will be clear to persons skilled in the art, exact quantities of viscosity enhancing agent and dispersion agent will depend on a number of factors including the type of agent used, the content of the cementitious paste and indeed the extrusion equipment in which the cementitious paste will be used."

Furthermore, the fact that an increase in efficacy of the VEA may be obtained with appropriate quantities of DA is entirely surprising and unexpected as clearly expressed in the specification. Furthermore, none of the cited references, whether relied upon by the Examiner in rejecting the claims or not, recognize the problem or need for increasing the efficacy of the VEA.

26. I note that the Examiner asserts on page 10 of the Examiner's Report that:

> "...one of ordinary skill in the art would have understood the fluidity or flowability of the cement mixture would be improved by adding a dispersant. This is inclusive of whether the mixture is being extruded, pumped, slurried or any other means of conveyance. The Applicant's only argue a functional limitation ....."

The Examiner is incorrect in this assertion. As discussed above, fluidity, pumpability and flowability are totally at odds with the claimed invention which, in contrast, relates to an extrudable cementitious formulation. There is no suggestion in the prior art of the surprising synergy between the VEA and a sulphonated DA. Furthermore, as discussed above, I disagree with the Examiner's belief that a

flowable/pourable/slurried/etc cementitious formulation is also suitable for extrusion processing. In fact, I have tried the DA alone in the dosage ranges used in the above-mentioned flowable/pourable/slurried/etc cementitious formulations; however, I have not been able to extrude any of these formulations.

27. In summary, the prior art does not directly teach nor suggest the claim limitation that: "the quantity of dispersion agent is sufficient to increase the efficacy of the viscosity enhancing agent during extrusion of said extrudable cementitious formulation."

28. As I have illustrated above, extrudable cementitious formulations are very different to cementitious formulations for use on conventional processing apparatus, which are typically slurried/pourable/flowable etc. I would not look to prior art for cementitious formulations for slurried/pourable/flowable compositions to inform me in relation to extrudable cementitious formulations.

29. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Chongjun Jiang

Technical Manager

Title

Date May 8, 2007

Exhibit A

Resume

PERSONAL PARTICULARS

Name: Chongjun Jiang
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Date of Birth: March 6, 1957
Citizenship: Australian

EDUCATION:

Ph.D Chemical Engineering & Industrial Chemistry, the University of New South Wales, Australia, 1992
B. Chem. Eng. (honors) Petroleum Processing & Chemical Engineering, Petroleum University, China, 1982

Educational qualification details:

University / Tertiary Institute:	**School of Chemical Engineering and Industrial Chemistry** **The University of New South Wales, Kensington, Australia**
Award Attained	**Ph.D** in Chemical Engineering
Details	**Major**: Catalysis/Reaction Engineering **Thesis**: *Studies of the Production of Hydrogen from Methanol Steam Reforming at Low Temperatures*
University / Tertiary Institute:	**Department of Petroleum Processing** **East China Petroleum Institute** (now, China University of Petroleum)
Award Attained	**B.Chem.Eng, Honours I**
Details	**Major**: Petroleum Processing & Chemical Engineering **Thesis:** *Design of a 3.5 Million-Tonne Distillation Tower for the Fractionation of Crude Oil*

CJ

Work Experience:

Title:	**Technical manager** (Feb 2003 ~ present)
Organization:	JH Research USA, LLC
Key Achievements / Responsibilities:	1. In charge of global research and development of extrusion process for manufacture of FRC building materials 2. Management of AET, TBR and HSC teams. 3. Commercialization of Artisan Roofing 4. Commercialization of new XLD trim in Peru, IL 5. Development of extruded Fascia product 6. Leading Extrusion Team and developing new FRC products, such as Flex Trim and Corner 7. Studied and sourced a number of raw materials with a potential of significant cost saving.

Title:	**Senior project manager** (May 2000 ~ Jan 2003)
Organization:	James Hardie Research Pty Ltd
Key Achievements / Responsibilities:	1. Managed the TRIM team and commercialized JH's first extruded product – XLD in Cleburne using single screw extrusion technology (May 2000~ Aug 2002) 2. Led the AET team and developed twin screw extrusion technology for low density FRC products – converting XLD from single screw to twin screw (Sep 2002 ~ Jan 2003) 3. Discovered the effect of clay on FRC product as important raw materials for JH's FRC products. 4. Developed and optimized the Artisan roofing formulations (Benchmark II & III) and process conditions, and 5. Characterized the unique features of the new roofing materials based on the understanding of the formulations and the raw materials

Title:	**Senior Project Engineer** (Aug 1998 ~ April 2000)
Organization:	James Hardie Research Ply Ltd
Key Achievements / Responsibilities:	1. Investigation and development of JH's FRC extrusion technology 2. Developed James Hardie's first extruded low density FRC product in the lab, including optimization of formulation and process conditions 3. Discovered the effect of Calsil in accelerating cement hydration, critical to the FRC extrusion. 4. Disclosed a large number of trade secrets and patents

Title:	**Senior Project Engineer** (June 1995 ~ Aug 1998)
Organization:	James Hardie Research Pty Ltd.
Key Achievements / Responsibilities:	1. Process control of Hatschek FRC processes a. Established a relationship between film moisture content/felt age and ILB 2. Development of a low-density TRIM product (HLD)

Title:	**Postdoctoral Research Fellow**
Organization:	The University of New South Wales (Oct 1992 ~June 1995)
Key Achievements / Responsibilities:	In collaboration with BHP Petroleum, developed a technology for catalytically converting aromatic fractions of petrol into diesel.

Title:	**Senior Project Engineer** (July 1984 ~ June 1986)
Organization:	Research Institute of Petroleum Processing, SINOPEC, Beijing
Key Achievements / Responsibilities:	Managed a team of 6 research engineers working on multi-million dollar oil processing projects, such as, catalytic hydrogenation reforming of straight gasoline, and FCC of heavy gas oil fraction etc.

Title:	**Project Engineer** (February 1982 to June 1984)
Organization:	Research Institute of Petroleum Processing, SINOPEC, Beijing
Key Achievements / Responsibilities:	Hydrogen desulphurization and denitrogenization of heavy gas oil.

Hobby

Listening music, swimming, cooking and fishing

PRIZES AND AWARDS:

- Academic award of RIPP, SINOPEC at development of process controlling software in 1984.
- Academic award of RIPP, SINOPEC at catalytic reforming processing of naphtha in 1986.

SELECTED PUBLICATIONS:

1. Jiang, C.J, Ma, L., Trimm, D.L.,. and Cant, N.W., "The production of hydrogen by oxidation and steam reforming of methane over platinum based catalysts". Proc. Of the 6th Asian Pacific Confederation of Chemical Engineering Conference combined with the 21th Australian and New Zealand Chemical Engineering Conference, APCChE & CHEMECA'93, Melbourne, Vol. 3, (1993) 93.

2. Jiang, C.J., Ma, L., Adesina, A.A. Trimm, D.L. and Cant, N.W., "Studies of the catalytic hydrogen production by autothermic oxidation and steam reforming of light hydrocarbons". Proc. of the 22nd Australian and New Zealand Chemical Engineering Conference, CHEMECA 94, Perth, Vol. 1, (1994) 86.
3. Jiang, C.J., Ma, L., Adesina, A.A. and Trimm, D.L., "Kinetic studies of steam reforming of light hydrocarbons over nickel based catalysts". Proc. of the 22nd Australian and New Zealand Chemical Engineering Conference, CHEMECA 94, Perth, Vol. 1, (1994) 189.
4. Jiang, C.J., Ma, L., Adesina, A.A., Trimm, D.L. and Wainwright, M.S., "Simulation studies of autothermal reactor for H2 production from methanol steam reforming". The Chemical Engineering Journal 99 (1996) 103.
5. Jiang, C.J., Ma, L. and Trimm, D.L. "The design and testing of an autothermal reactor for the conversion of light hydrocarbons to hydrogen. I. The kinetics of the catalytic oxidation of light hydrocarbons". Applied Catalysis A: General 138 (1996) 275
6. Jiang, C.J., Ma, L., Wang, D., Kim, D.H., Trimm, D.L. and Wainwright, M.S., "The effect of ZnO in Raney copper catalysts on methanol synthesis, water gas shift and methanol steam reforming reaction", the 11th International Congress on Catalysis-40th Anniversary. Studies in Surface Science and Catalysis. Vol. 101 (1996) 1379.
7. Jiang, C.J., Ma, L.Trimm, D.L. and Wainwright, M.S., "Optimization of an autothermic process for hydrogen production from methanol for fuel cells". Proc. of Chemeca'97, 29 September-1 October, (1997) 351, Rotorua, New Zealand.

Patent

A number of patents have been published.

Exhibit B

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/070,218	07/19/2002	Peter Cole Goodwin	131279.1016	9610

60148 7590 11/09/2006

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EXAMINER	
MARCANTONI, PAUL D	

ART UNIT	PAPER NUMBER
1755	

DATE MAILED: 11/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/070,218	GOODWIN ET AL.	
	Examiner	Art Unit	
	Paul Marcantoni	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12,14-20 and 22* is/are pending in the application.

4a) Of the above claim(s) *20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12,14-20 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *12,14-20 and 22* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/15/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Applicant's 8/15/06 RCE and arguments have been fully considered but they are not persuasive.

Provisional Obviousness Type Double Patenting:

Claims 12, 14-19, and 22 are provisionally rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-11 of US Patent Publication 2005/0045067 A1 (10/960,150 Naji et al.). Although the conflicting claims are not indentical, they are not patentably distinct from each other because Naji et al. teach a composition comprising cement, plastizer such as melamine sulfonate formaldehyde (page 2 [0033]), cellulose (p.3) and gums [0039] in amounts overlapping the instantly claimed invention.

35 USC 112 Second Paragraph:

Claims 12, 14-19, and 22 rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention.

The rejection over "density modifier" has been withdrawn. The examiner will give this term its full breadth of scope and note that a multitude of components added can modify density by either increasing it or decreasing it. Applicants broad terminology reads upon either instance.

While claim 20 is non-elected, the term acrylic *based* polymers is indefinite. The applicants state they can amend their claim to –polymer comprising at least one acrylic

monomer--- to replace acrylic based monomer. The examiner will not agree to this change as it could be construed as a new matter addition. However, should applicants state for the record that by acrylic based monomer they mean exactly ---a polymer comprising at least one monomer--- (to resolve any indefiniteness by a future review) the examiner will withdraw the indefiniteness rejection over "acrylic based" because then applicants would have clearly defined on record what they mean by that those terms.

Claim 12 can be construed as indefinite because the composition cannot be extruded without the presence of water. It appears applicants claim a dry blend that can later be extruded when water is added but that is not made clear in the claim. A dry blend without water is not extrudable.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

35 USC 102(b)

Claims 12, 14-19, and 22 are anticipated under 35 USC 102(b) over Fukuba et al. '697, Schermann et al. '383, or Dingsoyr '060, McCurrich et al. '480, Australian Patent A-55929/86 (Bell et al.), Kawai et al. '364, Matsuoka et al. '821, Valore '231, Burge et al. '123, Wada et al. '771, or Rirsch et al. '557, Sobolev et al. '289 B2, WO 8600291 (Sandoz), or Fujio et al. (Kao Corporation-JP 06-127992)..

Note: Shin et al. (KR 9508587 abstract) has been withdrawn because they do not teach a sulfonated dispersing agent in applicants' claimed range of 0.05 to 0.5 % by wt of dry solid of cementitious material. The lowest amount for Shin was 0.6% by wt of dry solid of cementitious material.

35 USC 103

Claims 12, 14-19, and 22 are unpatentable under 35 U.S.C. 103(a) over Fukuba et al. '697, Shin et al. (KR 9508587 abstract), Schermann et al. '383, Dingsoyr '060, McCurrich et al. '480, Australian Patent A-55929/86 (Bell et al.), Kawai et al. '364, Matsuoka et al. '821, Valore '231, Burge et al. '123, Wada et al. '771, or Rirsch et al. '557, Sobolev et al. '289 B2, WO 8600291 (Sandoz), or Fujio et al. (Kao Corporation-JP 06-127992) alone or in view of Hayakawa et al. '086, Downing et al. '199, Bobrowski et al. 145, Jungk '505, or Beyn '380.

The cited primary references teach the same components in overlapping amounts as claimed by applicants for their instant invention.

McCurrich et al. '480 teach a pumpable cement composition comprising silica (as in silica sand (see examples) light weight aggregate such as foamed slag, expanded perlite/vermiculite (density modifiers-see col.1, lines58-66 and col.2, line 2), sulphonated melamine formaldehyde, and a viscosity enhancer (gel agent) such as hydroxyethyl cellulose (col.1, lines 39-48) in amounts overlapping applicants' claimed composition. Note that McCurrich bases his amounts of components on the weight percent of the total composition and not based on cement as applicants do for their claims. Even if no explicit teaching of extrudable, this is an intended use. The new use (extrusion) of a known composition is not a patentable distinction. The pumpable McCurrich composition would also be extrudable because it contains the same amounts of the same components and this extrudable property would thus also have been expected.

AU 55929/86 teaches a composition comprising cement, 0.3 to 3 wt% sulfonated melamine formaldehyde (see p.7, line 1 and last paragraph), a water soluble polymer including cellulose ether, alginates, polyvinyl alcohol, etc. (p.8, lines 15-20) in amounts of about 0.01 to about 0.1 wt%. Yet, about permits some tolerance and about 0.1 could potentially read upon 0.3 wt% (applicants lower limit of amount of viscosity enhancer). Further, AU '929 teaches that any amount sufficient to extend effective fluidity may be employed. It is the examiner's position that adding slightly more would have been in the

range of any amount sufficient to extend fluidity which includes applicants lower limit of 0.3 wt%.

Kawai et al. '364 teach a composition comprising cement, sulfonated melamine formaldehyde superplasticizer, segregation control agent (e.g. cellulose), silica fume, aggregate (Table 1 in col.4) in amounts overlapping and thus anticipating applicants' claims (see Kawai claims). Even if not anticipated, overlapping ranges of amounts would have been prima facie obvious to one of ordinary skill in the art.

Matsuoka et al. '821 teach a composition comprising cement, glucan as viscosity enhancer (col.3, lines 40-45) in amounts of 0.01 to 1 wt% (claim 9 in col.8), sulfonated melamine formaldehyde condensate (col.3, lines 50-55) in amounts o f 0.5 to 3.0 wt% (claim 12 in col.8), fly ash, and silica fume (col.2, lines 10-20) thus anticipating applicants' invention. Even if not anticipated, overlapping ranges of amounts would have been prima facie obvious to one of ordinary skill in the art.

Valore '231 teaches a composition comprising cement, superplasticizer (e.g. sulfonated melamine formaldehyde-see col.3, lines40-42), thickeners such as cellulose gums guar gum, clays (col.4, last paragraph), and fly ash (claim 9 in col.11). The amounts of superplasticizer/water reducer (synonymous) are 0.2 to 2 wt% and the amount of thickener is 0.01 to 2 wt% (col.7, lines 45-55). Valore thus anticipates applicants' claims. Even if not anticipated, overlapping ranges of amounts would have been prima facie obvious to one of ordinary skill in the art.

Burge et al. '123 teach a composition comprising cement, sulfonated melamine formaldehyde condensate in amounts of 0.2 to 5 wt% (col.4, lines 5-10 and col.5, line

29), thixotropic agents (e.g. cellulose ethers-col.4, lines 40-43) in amounts of 0.01 to 10 wt% (col.5, lines 44-45), slag, fly ash, pozzolan, silica fume, etc. thus anticipating applicants' claims. Even if not anticipated, overlapping ranges of amounts would have been prima facie obvious to one of ordinary skill in the art.

Wada et al. '771 teach a composition comprising cement, cellulose (col.4, lines 25-40), polyvinyl alcohol in amounts of 0.I to 10 parts by weight (col.4, lines 40-50) which can be a viscosity enhancer, and a wetting agent or surfactant which is the same as a dispersant (see col.5, lines 1-2). The surfactant is polyethylene glycol ether yet other known conventional surfactants/dispersants may be substituted because they are functionally equivalent such as applicants' melamine formaldehyde condensate (a dispersant is a water reducer is a surfactant is a plasticizer is a superplasticizer-all synonymous terms). Even if not anticipated, overlapping amounts would have been prima facie obvious to one of ordinary skill in the art as would the use of another known and functionally equivalent surfactant/dispersant such as sulfonated melamine formaldehyde.

Rirsch et al. '557 teach a composition comprising cement, cornmix SP2 (melamine formaldehyde sulfonate-col.8, lines 40-50), fibers including PVA fibers which thus also read upon viscosity enhancer (col.6, line 46), aggregate (col.5, lines 25-30), and acrylic polymers and copolymers which also can read upon viscosity enhancer (col.10, lines 53-60). Even if not anticipated, overlapping ranges of amounts would have been prima facie obvious to one of ordinary skill in the art.

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Sobolev et al. (US 6,645,289 B2) also appears to teach a cement composition comprising sulfonated dispersant (sulfonated melamine formaldehyde-col.2, line 52), and water soluble polymer such as cellulose, acrylic acid copolymers, polyvinyl alcohol, etc. (see col.3, lines 25-40) and aggregate (col.5, first paragraph) in overlapping amounts. Sobolev et al. further teach this composition has excellent workability and pumpability and can undergo extrusion (see col.5, lines 45-50 and lines 60-65). Even if not anticipated, overlapping ranges of amounts would have been prima facie obvious to one of ordinary skill in the art.

WO 8600291 (Sandoz) was cited by applicants and it still teaches applicants' claimed invention especially meeting the limitations of claim 12. Note that the amount of 0.2 lignosulfonate meets the requirement of applicants' claimed amounts for sulfonate dispersant and 0.07 wt% cellulose + 0.6 wt% sodium gluconate meet the limitation for viscosity enhancing agent. Notice that applicants do not claim any specific viscosity enhancing aent such as cellulose so it can also read upon the sodium gluconate as a viscosity enhancer.

Fujio et al. (Kao Corporation-JP 06-127992) was prior art cited by applicants and could also have been used in a rejection under 35 USC 103 of applicants' claims as it teaches cement composition for extrusion with an amount of cellulose of 1.0 to 10 wt% and 0.6 to 3.0 wt% sulfonated dispersant. It only differs by 0.1 wt% which would not appear significant since the greater amount still allows for extrudability. While the amount of sulfonated dispersant is only so slightly in excess, it meets applicants functional limitation "wherein the quantity of dispersion agent is sufficient to increase the

efficacy of the viscosity enhancing agent during extrusion of said extrudable cement composition.

Hayakawa et al. '086 has been combined with the primary references to show that it is conventional in the art to add pulp fiber and silica or other aggregate to extrudable compositions (col.4, lines 9-14).

Downing et al. '199 teaches that dispersing agents are the same as plasticizer, superplasticizers, or water reducing aids or agents (col.1, last line and col.2, lines 1-2). Downing teaches that these components are known to be added to cement compositions to improve dispersability and ultimately extrusion (col.2, lines 1-24).

Bobrowski et al. '145 teach adding MELMENT or melamine formaldehyde condensate to cement would have been an obvious design choice for one of ordinary skill in the art because superplasticizers are known to improve flowability of cement and improve pumpability and can be used for complicated form work (col.2, lines 20-36 and 57-59). Extrusion is one example of complicated form work and thus it is an advantageous and obvious design choice to include a superplasticizer to improve flowability, pumpability, and extrudability.

Jungk '505 has been cited to note that it would have been an obvious design choice for one of ordinary skill in the art to use another known surfactant other than such as Wada et al. 771's polyethylene glycol ether. Jungk et al. teach that dispersants (Jungk's so called "binder" is a dispersant and dispersants are surfactants) including polyglycol ether, alkylbenzene *sulfonate,* and melamine formaldehyde condensate are all functionally equivalent dispersants and thus functionally equivalent surfactants (see

col.3, lines 30-49). Beyn '380 similarly teaches that surfactants suitable for combination with thickeners (another name for applicants "viscosity enhancers") include polyglycols an sodium dodecylbenzene sulfonate (see col.6, lines 5-22) and the use of a specific dispersant/surfactant would have been an obvious design choice for one of ordinary skill in the art because they are functionally equivalent.

Response

Provsional ODP:

Applicants argue that the ODP references do not teach that the quantity of dispersing agent is sufficient to increase the efficacy of the viscosity increasing agent during extrusion. The examiner disagrees and notes that one of ordinary skill in the art would have understood the fluidity or flowability of a cement mixture would be improved by adding a dispersant. This is inclusive of whether the mixture is being extruded, pumped, slurried, or any other means of conveyance. The applicants only argue a functional limitation and state that one of ordinary skill in the art would have no understanding that dispersants improve fluidity and flowability of mixtures in a variety of means of conveyance (pumpability, extrusion, etc.).

35 USC 103:

The applicants argue the prior art does not teach the functional limitation "wherein the quantity of dispersion agent is sufficient to increase the efficacy of the viscosity enhancing agent during extrusion..." The examiner disagrees. The prior art teaches the same components (viscosity enhancer and dispersing agent) in the same

amounts and the properties resulting (whether extrudablity, fluidity, flowability, pumpabfility, etc.) would have been the same.

The applicants argue Fukuba and argue that the ranges do not overlap. Yet, it appears applicants comparison is not an apples to apples comparison but an apples to oranges comparision. The applicants claimed extrudable composition (that contains no water which is necessary for extrusion) contains no water versus, for example, Example 5, Table 5 of Fukuba's composition which does contain water. The applicants compare their own dry blend to a wet blend that already contains water. Removing the water from these examples would place the dry blends of the prior art within the range claimed by applicants for their invention.

Scherrman et al. '383 and Dingsoyr both teach overlapping amounts and since the amounts are the same it as applicants the properties such as extrudability would have been expected to be the same. The examiner disagrees this composition is not extrudable because the applicants' *claimed* composition which contains the same components is extrudable. The same goes for Dingsoyr.

Shah et al. '374 has not been applied in the rejection as applicants state the amount of dispersant/water reducer is outside their claimed ranges (see Table 4).

The applicants argue that Fujio (JP 06-127992) does not teach their water soluble cellulose ether polymers. It would appear that the cellulose powder is still a polymeric material. Further, even if the specific cellulose ether polymers (MC,HMC, or CMC) are not mentioned, applicants are not claiming any of these specific polymers in claim 1. It is improper to argue a limitation not even present in the claim and claim 1

merely states a viscosity enhancing additive of which cellulose powder is one and overlaps applicants amounts. While it is true that the claims may be read in light of the specification, it is improper to read the limitations of the specification into the claims. In re Yamato, 222 USPQ 93; In re Wilson, 149 USPQ 523; Graver Tank v. Linde Air Products Co. 80 USPQ 451 (Supreme Court). The abstract also teaches a water reducing agent including sulfonates that are dispersing agents in applicants' amounts and teaches that this composition is extrudable. It thus meets the applicants' claims.

The applicants state that Sobolev et al. '289 B2 does not relate to extrusion of cement compositions. The examiner disagrees. Applicants are referred to column 5, line 65 which teaches that it *can* be used in an extrusion process.

The applicants argue the alleged new intended use of a known composition. The applicants do not disagree that WO 86/00291 (Sandoz AG) contains the same components in overlapping amounts. A composition which contains the same components in overlapping amounts as applicants would also have been expected to be extrudable because the composition is the same. It is also noted that the new use of a known composition (or alleged new use such as extrusion) is not a patentable distinction if the prior art teaches the claimed composition.

The examiner would rejoin claim 20 should at some future point in prosecution claim 12 be found allowable. Presently, however, the claims remain rejected for the reasons stated above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Marcantoni whose telephone number is 571-272-1373. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul Marcantoni
Primary Examiner
Art Unit 1755

Exhibit C

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in this application.

Listing of Claims:

1-11. (Cancelled)

12. (Currently Amended) An extrudable cementitious formulation comprising

a cementitious material,

~~optional ingredients~~ at least one ingredient selected from the group consisting of lime, silica, density modifiers, reinforcing fibres and mixtures thereof, and

0.3-5% by weight of dry solids of cementitious material of viscosity enhancing agent and 0.05-0.5% by weight of dry solid of cementitious material of a sulphonated dispersion agent, wherein the quantity of dispersion agent is sufficient to increase the efficacy of the viscosity enhancing agent during extrusion of said extrudable cementitious formulation.

13. (Cancelled)

14. (Original) A cementitious formulation as claimed in claim 12 wherein dispersion agent is added in a quantity sufficient to maintain extrudability with a reduced dosage of viscosity enhancing agent as compared to a conventional dosage.

15. (Original) A cementitious formulation as claimed in claim 12 wherein dispersion agent is added in a quantity sufficient to maintain extrudability with a lower grade or lower molecular weight viscosity enhancing agent as compared to a conventional dosage.

16. (Original) A cementitious formulation as claimed in claim 12 wherein dispersion agent is added in a quantity

sufficient to improve extrudability for a quantity of viscosity enhancing agent substantially equivalent to a conventional dosage.

17. (Original) A cementitious formulation as claimed in claim 12 wherein the viscosity enhancing agent is a cellulose ether.

18. (Original) A cementitious formulation as claimed in claim 12 wherein the viscosity agent is hydroxyl alkyl cellulose, hydroxyl alkyl alkyl cellulose, carboxy alkyl cellulose or alkyl cellulose, or mixtures thereof.

19. (Original) A cementitious formulation as claimed in claim 12 wherein the viscosity enhancing agent is selected from the group consisting of hydroxyl propyl methyl cellulose, hydroxyl ethyl methyl cellulose, methyl cellulose, hydroxyl ethyl cellulose, carboxy methyl cellulose, ethyl cellulose and hydroxyl butyl methyl cellulose, or mixtures thereof.

20. (Withdrawn) A cementitious formulation as claimed in claim 12 wherein the viscosity enhancing agent is selecting from the group consisting of polyvinyl alcohols, gums include Welan gum, locust bean gum guar gum, sodium alginate, swellable alkali emulsions of acrylic co-polymers, clays or modified clays, polyethylene glycol and acrylic based polymers or mixtures thereof.

21. (Cancelled)

22. (Previously Presented) A cementitious formulation as claimed in claim 12 wherein the dispersion agent is sulphonated melamine formaldehyde.

23-51. (Cancelled)